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THE BUILDERS' GUIDE AND POCKET COMPANION,

FOR

Carpenters, Contractors and Builders.

I. P. HICKS, Publisher,
Omaha, Neb.

SECOND EDITION.

1890.

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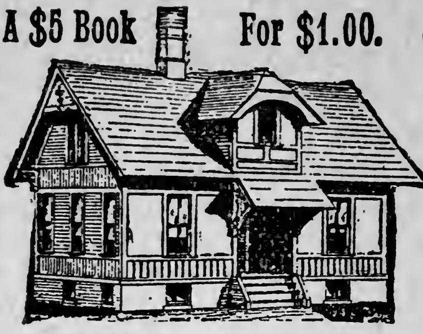

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Index to Contents.

Page.
Estimating 1, 17
Estimating roofs, Surface Measurents of 11
List of items for Estimatiug Lumber.... 4
Pointers on Estimating................. 27
Rules for Estimating................... 8
Roof Framing, Hips and Valleys........ 36
Rafter Table........................... 38
Table of Prices for Estimating Labor....20
Table of Prices for Estimating Lumber..24

PREFACE.

The importance of such a work as "The Builders' Guide and Pocket Companion," will be apparent to every one who will merely attempt an inspection of its contents; while to any one who will give its pages a few hours of careful consideration and attention, the convenience and usefulness of the work will be assured.

From actual experience, we know, that there are many things about building, which if arranged for concise and ready reference and put into book form; would be a valuable aid to the Carpenter and Contractor.

Feeling the need of this ourself, and seeing frequent inquiries in Building Journals for such works, has lead us to the belief that a book condensed in form, giving in an easy, practical way, general items of interest and value to the Carpenter and Contractor, is much needed.

Feeling confident that to see this work and examine it, will be to insure its entire appreciation and acceptance;

I remain, Yours Respectfully,

I. P. Hicks.

ESTIMATING.

In the correspondence columns of CARPENTRY AND BUILDING, we find the following from a brother carpenter.

From J. I. M. Westerly, R. I. I wish to suggest that an article on estimating would be valuable to the readers of CARPENTRY AND BUILDING. We have a great deal of estimating to do and I find that one has to be very careful indeed or something will be omitted. It seems to me that if a person had a list of all the parts usually employed in the construction of a building, it would be a comparitively easy matter for him to look through the list, and by this means see that he has included everything Such a list would be of great value, and if the list is complete the one using it will be sure to mention everything required. For one I should appreciate such an article.

Again in CARPENTRY AND BUILDING we find the following:

From X. Q. Hamilton, Ont. I would like to ask the readers of CARPENTRY AND BUILDING for a copy of the shortest, most condensed, every day practical system of estimating, something that can be used in just as few lines as possible.

The above letters are similar to many which we have seen in CARPENTRY AND

BUILDING from time to time. It is very reasonable to suppose that the wants of these mechanics are what thousands of members of the craft have long been wanting.

To make an estimate for a building, will always require a careful consideration of the plans and specifications, as well as a considerable amount of figuring. Practical experience and personal familiarity with every item that enters into the construction of a building, is what every man needs in order to become a good estimator; yet this is no reason why he can not learn, or profit from the experience of another. We ourselves, have felt the need of a work giving in a concise and easy manner, the shortest, easiest, quickest and surest way of estimating.

Some parts of a building are easily estimated by the Square,* some by the foot, and some parts are best estimated by the piece. Now, when it is known what it is worth to do different kinds of work by the square, foot, or piece, we think the cost of labor necessary to complete a building, may be readily estimated by any person endowed with an average amount of common sense and ordinary intelligence.

*A square is 100 square feet.

In estimating material many mistakes are made from omissions. This is a frequent source of mistakes. A bill of material for the construction of a house always requires a long list of items, and it frequently happens that some items have been forgotten and left entirely out of consideration. In cases of contract work, such mistakes are very detrimental to the contractor's profits. They are things he did not count on, but nevertheless he has them to buy, and as extras, he always has to pay more for them than he would, had he included them in his original bill. Now, if a person had an itemized list of every item that enters into the construction of a building, there is no doubt that by comparing his bill with the list, mistakes from omitting items would be avoided.

In a bill, there are many items of material that are used for different purposes and different parts of a building; hence, to make a list complete in every detail, it should mention every part of a building for which an item is likely to be used for. In the list, the principal items are printed in CAPITALS and the different parts for which the same are used, are printed in small letters.

LIST OF ITEMS

FOR ESTIMATING LUMBER.

SILLS.
Side Sills.
End Sills.
Middle Sills.
Trimmers.
POSTS.
Main Posts.
Center Posts.
Door Posts.
Basement Posts.
GIRTS.
Main Girts.
Side Girts.
Tie Girts.
JOISTS.
First Floor.
Second Floor.
Third Floor.
Ceiling Joists.
Porch Joists.
STUDDING.
Side studding.
Gable studding.
Partition studding.
Braces.
Plates.
Porches.
Baywindows.
ROOF TIMBERS.
Common Rafters.
Hip Rafters.
Valley Rafters.
Jack Rafters.
Trusses.
Perlines.
Collar Beams.
SHEATHING.
Outside Walls.
Roof Sheathing.
Gutters.
Floor Lining.
SHIPLAP. Sometimes used for sheathing.
SHINGLES.
Dimension Shingles.
SIDING.
Beveled siding.
Cove siding.
Barn siding.
BATTENS.
7-8 Ogee Battens.
1-2 Inch Battens.

LIST OF ITEMS

FOR ESTIMATING LUMBER, Con.

FURRING.
1x2 Inch.
2x2 Inch.
FENCING.
4 Inch.
6 Inch.
PAPER.
Straw Board.
Tarred Paper.
$\frac{7}{8}$ FINISH.
Outside Base.
Baywindow Finish.
Porch Finish.
Cornice.
Brackets.
Stair Risers.
Jamb Casings.
Pantry Shelves.
Closet Shelves.
$1\frac{1}{4}$ FINISH.
Outside Casings.
Corner Boards.
Jamb Casings.
Porch Finish.
Baywindow Finish.
Scroll Work.
Stair steps & Stringers.
Outside Steps.
2 INCH FINISH.
Door Sills.
Window Sills.
Jamb Casings.
Brackets.
Cellar Stairs.
$1\frac{3}{8}$ FINISH.
Outside Casings.
Outside Steps.
$\frac{1}{2}$ INCH FINISH.
Panels.
Drawer Bottoms.
FLOORING.
Main Floors.
Kitchen Floor.
Dining Room Floor.
Porch Floors.
CEILING.
Porch Ceilings.
Panels.
Wainscoting.
Lining Partitions.

LIST OF ITEMS

FOR ESTIMATING LUMBER, Con.

INSIDE FINISH.
Casings.
Corner Blocks.
Plinth Blocks.
Base.
Stair Rail.
Newel Posts.
Balusters.
MOULDING.
Bed Moulding.
Crown Moulding.
Panel Moulding.
Base Moulding.
Cove Moulding.
Quarter Round.
¾ Round.
Door Stops.
Window Stops.
Parting Stops.
Wainscoting Cap.
Window Stools.
Water Table.
Thresholds.
DOORS.
Front Doors.
Sliding Doors.
Closet Doors.
Cupboard Doors.
Cellar Doors.
WINDOWS.
Baywindows.
Pantry Windows.
Cellar Windows.
Transoms.
Art Glass.
Plate Glass.
BLINDS.
Outside Blinds.
Inside Blinds.
Corner Beads.

WHAT IT TAKES.

Jamb Casings for windows $\frac{7}{8}$ finish ..	10 ft.
" " " " $1\frac{1}{4}$ " ..	12 "
" " " doors $\frac{7}{8}$ finish ..	10 "
" " " " $1\frac{1}{4}$ "	12 "
" " " " $1\frac{1}{2}$ "	15 "
" " " " 2 inch finish	20 "
Outside Casings for windows $\frac{7}{8}$ finish	8 "
" " " " $1\frac{1}{4}$ "	10 "
" " " doors $\frac{7}{8}$ "	10 "
" " " " $1\frac{1}{4}$ "	12 "
Inside Window Casings lineal measure	20 "
" Door Casings, one side, lineal ..	18 "
" " " two sides, lineal ..	36 "
Band Moulding window frames	16 "
" " door frames, one side	18 "
" " " " two sides	36 "
Molding outside caps of frames.......	4 "
Sills for windows per frame...........	$3\frac{1}{2}$ "
" " doors " "	4 "
Window Stops " ".........	12 to 18 "
Parting " " ".........	12 to 18 "
Door .... " " ".........	16 to 18 "
Porch columns	24 to 30 "
Brackets	4 to 6 "
Horses and treads for stairs $1\frac{1}{4}$ finish	110 "
For risers $\frac{7}{8}$ finish.................	70 "

Rules for Estimating.

To 3	inch	flooring	add	$\frac{1}{3}$	for the	matching.
" 4	"	"	"	$\frac{1}{4}$	"	"
" 6	"	"	"	1-5	"	"
" 4	"	ceiling	"	$\frac{1}{3}$	"	"
" 6	"	"	"	1-5	"	"
" 8	"	shiplap	"	1-6	"	"
" 10	"	"	"	$\frac{1}{8}$	"	"

To 6 inch beveled siding, add 1-6 for the lap and make no deduction for openings, for in general, the waste in cutting will equal the amount gained by openings.

In estimating sheathing for roofs, make no allowance for spreading the boards. Calculate the same as you would to sheathe a roof close, for what is gained in spreading the boards is generally lost in the cutting. The boards should never be placed more than 2 inches apart for a good roof. If a roof is to be sheathed close then add $\frac{1}{8}$ for waste in cutting. Sheathing for gutters is an item often forgotten. It should be estimated from 1 to 2 feet wide the length of the gutters. This often amounts to several hundred feet on large jobs. Sheathing is one of the items which carpenters usually fall short of. The

reason is obvious, it being one of the cheapest kinds of material, it is used for many purposes the carpenter does not count on. Wherever a board is wanted for one purpose or another, if a sheathing board will answer, it is taken; and several hundred feet are usually used in building scaffolds. Most of this is wasted by being nailed, sawed, and split up. It is safe to say, that in estimating sheathing, 1-5 should be added to the amount.

In estimating shingles, allow 9 to the square foot when laid $4\frac{1}{2}$ inches to the weather, and 8 to the foot when laid 5 inches to the weather.

Common shingles are estimated to average 4 inches wide, and are put up 250 in a bunch, 4 bunches to the thousand. Dimension shingles are usually 5 or 6 inches wide, and are put up 150 to 180 in a bunch, 4 bunches are counted a thousand. In reality there is not a thousand shingles, but being wider than the average of common shingles, they are counted the same.

There is more waste in laying dimension shingles than the common ones. $\frac{1}{8}$ should be allowed for the waste in laying dimension shingles.

To estimate studding for the outside walls and partitions in houses, estimate them 12 inches from centers, then, when they are set the usual distance, 16 inches from centers, there will be enough for all necessary doubling around doors, windows and corners.

We prefer this rule for the following reasons.

FIRST. Because it is easier to count the studding 12 inches from centers than 16 inches, as the number of feet in length of an outside wall, or a partition, gives the number of studding, and is seen at once.

SECOND. Mistakes are less liable than in estimating 16 inches from centers, and adding for double studding, as in adding for double studding, more than one half the places requiring double studding will be overlooked.

Some say that the plan of estimating studding 12 inches from centers will not hold out or make up for doubling; but we are of the opinion that these people leave out some portion of a wall, a partition, or perhaps the plates. The rule is not intended to make up for things left out, it is only for making up the number of double studding required around doors, windows and corners. Plates

and other places requiring studding must be estimated separately.

Studding is an item that the carpenters usually fall short of, for the simple reason that many are used in places that were overlooked in the carpenter's estimate.

How to Find the Area or Surface Measurement of Hip and Valley Roofs.

To Find the Area of Hip Roofs With Decks.—Add the length at the eves and at the deck together, multiply their sum by ½ the length of the common rafter; the product will be the area of the given side. If there are two or more sides alike multiply the area already found by the number of sides. If the sides are unlike, then the total area will be found by adding the area of each side respectively. The area of the deck is found by multiplying the length by the width.

Example.— What is the surface measurement of a hip roof on a building 20x24 feet, allowing 1 foot each side for the projection of the cornice, the size of deck to be 4x8 feet, and the length of the common rafter 12 feet.

ANALYSIS. Taking the long side of the building and adding 1 foot each side for the cornice, we have 26 feet the length at the eves, 8 feet the length at the deck, 12 feet the length of the common rafter, and 2 sides alike. Hence, the operation will be as follows:

$26+8\div\frac{1}{2}\times12\times2=408$ ft. area of 2 long sides.
$22+4\div\frac{1}{2}\times12\times2=312$ ft. area of 2 short sides.
$4\times8=$.......... 32 ft. area of deck.
$408+312+32=$...752 ft. total area of roof.

TO FIND THE AREA OF HIP ROOFS WITHOUT DECKS.—Multiply ½ the length at the eves by the length of the common rafter; the product will be the area of the given side. If there are two or more sides alike multiply the side already found by the number of sides. If the sides are unlike, add the area of each side respectively.

EXAMPLE.—What is the surface measurement of a hip roof on a building 24x24 feet,

allowing 1 foot each side for the projection of the cornice, and the length of the common rafter to be 15 feet.

ANALYSIS.—Adding 1 foot each side for the cornice we have 26 feet the length at the eves, the length of the common rafter 15 feet, and 4 sides alike.

OPERATION.—$26 \div \frac{1}{2} \times 15 \times 4 = 780$ feet the total area of the roof.

TO FIND THE AREA OF ROOFS WITH THREE OR MORE GABLES.—Add the length at the eves and ridge together, and multiply $\frac{1}{2}$ their sum by the length of the common rafter. The product will be the area of the given side. If the sides are alike multiply the area of the side already found by the number of sides. If the sides are unlike add the area of each side respectively.

EXAMPLE.—What is the area of a gable roof on a building 16x24 feet with a wing 16x12 feet, allowing 1 foot for the projection of the cornice and the length of the common rafter to be 12 feet.

ANALYSIS.— By the conditions of the example it will be seen that the two sides on the main roof are unlike, and the two sides of the wing are alike. Hence the operation will be as follows:

$26 \times 12 = 312$ ft., area of one side.

$26 + 9 \div \frac{1}{2} \times 12 = 210$ ft., area of the other side.

$13 + 21 \div \frac{1}{2} \times 12 \times 2 = 408$ ft., area of both sides of the wing.

Then, $312 + 210 + 408 = 930$ feet, total area of the roof.

We will now take a more complicated roof and find the area, to show the reader an example in the surface measurements of complicated roofs.

EXAMPLE.— What will be the area of a gable roof of $\frac{1}{2}$ pitch, on a building the main part of which is 20x38 feet, with right wing 16x14 feet, left wing 12x16 feet, and allowing 15 inches for the projection of the cornice.

Analysis.— The first step will be to establish the necessary lengths of rafters and roofs from which to figure.

Length of rafter on main roof, 15 ft. 5 in.
Length of roof, 40 ft. 6 in.
Length of rafter on right wing, 12 ft. 7 in.
Length of roof at the eves, 15 ft. 3 in.
Length of roof at the ridge, 23 ft. 3 in.
Length of rafter on left wing, 9 ft. 9 in.
Length of roof at the eves, 17 ft. 3 in.
Length of roof at the ridge, 23 ft. 3 in.

Next, multiplying the length of the main roof by the length of rafter, and this product by 2, we have; 40 ft. 6 in. $\times$ 15 ft. 5 in. $\times 2 = 12$ 48 ft. 9 in. total area of the main roof. Now, a portion of the main roof will be covered by the roof of the wings joining it; hence, the amount covered by the wings must be deducted.

To find this amount, multiply $\frac{1}{2}$ the width of the wing by the length of the wing rafter.

Taking the right wing, we have $16 \div \frac{1}{2} \times 12$ ft. 7 in. $=100$ ft. 8 in. the amount of main roof covered by roof of right wing.

Taking the left wing, we have $12 \div \frac{1}{2} \times 9$ ft. 9 in. $=58$ ft. 6 in. the amount of main roof covered by roof of left wing.

Hence, 1248 ft. 9 in. $-$ 100 ft. 8 in. $-$ 58 ft. 6 in. $=$ 1089 ft. 7 in. actual area of main roof to be covered.

Next, take the right wing, 15 ft. 3 in. $+$ 23 ft. 3 in. $\div \frac{1}{2} \times 12$ ft. 7 in. $\times 2 = 484$ ft. 6 in. total area of right wing roof.

Next, take the left wing, 17 ft. 3 in. $+$ 23 ft. 3 in. $\div \frac{1}{2} \times 9$ ft. 9 in. $\times 2 = 394$ ft. 11 in. total area of left wing roof.

Then, 1089 ft. 7 in. $+$ 484 ft. 6 in. $+$ 394 ft. 11 in. $=$ 1969 ft. total area of the roof.

To Find the Area of a Gable.—Multiply $\frac{1}{2}$ the width by the rise above the level of the plates.

Example.—What is the area of a gable 24 feet wide, and 8 feet rise.

Operation.— $24 \div \frac{1}{2} \times 8 = 96$ feet area of gable.

To show another point in estimating, we will refer our readers to a letter and its answer in the October number of CARPENTRY AND BUILDING 1889.

From J. A. A.— Being a reader of CARPENTRY AND BUILDING I desire to ask a question, the answer to which will be of some advantage to me. I am a carpenter and desire to learn the art of estimating ordinary buildings. I have no experience in figures, but am aware that different theories are held by different men concerning this work. My idea is to figure materials and then study how long it would take to put the work in place. I am advised by some that the proper way is to figure on certain percentages for labor. Still other contractors have a list stating how much is considered a day's work for a man and figure therefrom. Now, I cannot understand either of these plans and would be much obliged for some information on this point.

NOTE.—We think our correspondent's idea is much the best of the different plans suggested. It is comparitively easy to asertain the materials necessary to build a given structure, but how much labor is required to put the structure in place depends upon various contingencies. It will be influenced first by the character of the workmen employed; next by the skill with which the work has been planned, so far as features of construction are concerned, and last, but not least, upon the intelligence of the management under which the men work day by day. Now, what our correspondent wants to know is not what others can do, but what he can do himself. We would advise him by all means to follow his own ideas and not be lead into the quicksand of guesswork or of reliance upon percentages.

From the above note and others which we

have frequently seen in CARPENTRY AND BUILDING, one is almost lead to believe that there is no way of estimating the cost of labor required to build a certain structure, with any certainty of accuracy, without personal knowledge, and practical experience in every detail of the business. This is all very true, practical experience is necessary for accurate estimating; yet, as to obtaining the desired information, or the best way of obtaining the necessary experience which many of the correspondents are clamoring for, CARPENTRY AND BUILDING fails to throw very much light upon the subject. We agree that no reliance can be placed upon percentages, as the cost of material does not usually have anything to do with the cost of labor. CARPENTRY AND BUILDING says: "Now, what our correspondent wants to know is not what others can do, but what he can do himself."

Here is where we differ, for no man can be very much of a contractor and do all of his own work, in fact, most contractors are almost entirely dependent upon others to do their work; therefore, it is necessary that they should know what others can do, and be able to judge of an average day's work. To have a list showing the average day's work

of all kinds, and to figure therefrom is perfectly right, and if the list is complete, the one using it will obtain as satisfactory results as can be obtained in any way.

It is true that some men will do much more work in a day than others, but estimates should never be made from a big day's work, but an average fair day's work. If an estimate cannot be made from what is known to be an average day's work, then there is no other alternative than a guess based upon the experience and judgment of the contractor; and a conclusion is generally drawn in this way; Mr. A's job cost so much— Mr. B's job, perhaps, is different in size, shape, and style, but I guess it can be built for so much.— Of all the ways of estimating, a well prepared list to figure from, is the easiest, quickest and surest.

Accordingly we have prepared a list showing the average day's work, rate per square, foot, or piece, with columns in which to enter your own rate and average.

There can be no doubt whatever, that the men who will keep a record of the time it takes to do different kinds of work by the square, foot, or piece, and enter their rate and average in the table, they will soon have something that will be very much to their advantage in estimating.

TABLE OF PRICES

FOR ESTIMATING LABOR.

Different Kinds of Work.	No. of Squares.	Rate per Square.	Your own Average.	Your own Rate.
Framing floors in houses.	5	$ .70	.....	....
Framing floors in barns.	4	.90	.....	....
Framing outside walls of houses.	6	.90	.....	....
Framing outside walls of barns.	4	.90	.....	....
Framing and setting partitions.	6	.60	.....	....
Framing ceilings......	7	.50	.....	....
Framing plain roofs...	6	.60	.....	....
Framing hip and valley roofs.	3	1.20	.....	....
Sheathing sides with common sheathing.	8	.45	.....	....
Sheathing sides with 8 inch shiplap.	7	.50	.....	....
Sheathing sides with 6 inch flooring.	6	.60	.....	....
Sheathing roofs with common sheathing.	8	.45	.....	....
Sheathing roofs with 8 inch shiplap.	6	.60	.....	....
Sheathing roofs with 6 inch flooring.	5	.70	.....	....
Shingling with common shingles.	2½	1.40	.....	....
Shingling with dimension shingles.	2	1.75	.....	....
Siding with 6 inch beveled siding.	3	1.[illegible]0	.....	....

TABLE OF PRICES

FOR ESTIMATING LABOR, Continued.

Different Kinds of Work.	No. of Squares.	Rate per Square.	Your own Average.	Your own Rate.
Siding, 6 inch beveled, using paper.	2½	$1.40	......	....
Siding with 6 inch cove siding.	2½	1.40	......	....
Siding, 6 inch cove, using paper.	2	1.75	......	....
Siding with 12 inch barn boards.	6	.60	......	....
Siding, 12 inch barn boards and battened.	4	.90	......	....
Laying floor with 6 inch pine flooring.	6	.60	......	....
Laying floor with 4 inch pine flooring.	4½	.80	......	....
Laying floor with 6 inch hard wood.	5	.70	......	....
Laying floor with 4 inch hard wood.	4	.90	......	....
Laying floor and smoothing off.	2	1.75	......	....
Ceiling with 6 inch pine ceiling.	4	.90	......	....
Ceiling with 4 inch pine ceiling.	3	1.20	......	....
Plain wainscoting	4	.90	......	....

TABLE OF PRICES

FOR ESTIMATING LABOR, Continued.

Different Kinds of Work.	No. of Pieces.	Rate per Piece.	Your own Average.	Your own Rate.
Making plain window frames.	3	$1.20	.....	....
Making plain door frames.	4	.90	.....	....
Making Transom frames.	3	1.20	.....	....
Setting frames........	14	.25	.....	....
Hanging Blinds before frames are set, per win.	14	.25	.....	....
Hanging Blinds after frames are set, per win.	8	.45	.....	....
Hanging inside Blinds, per window.	5	.70	.....	....
Fitting Sash in frames, per window.	18	.20	.....	....
Hanging Sash with weights, per window.	14	.25	.....	....
Hanging Transoms....	10	.35	.....	....
Casing Windows......	12	.30	.....	....
Casing Doors, one side.	16	.22	.....	....
Casing Doors, both sides.	8	.44	.....	....
Casing Transom Frames, one side.	12	.30	.....	....
Casing Transom Frames, both sides.	6	.60	.....	....
Cutt ng in Window Stops.	40	.09	.....	....
Cutting in Door Stops.	30	.12	.....	....

TABLE OF PRICES

FOR ESTIMATING LABOR, Continued.

Different Kinds of Work.	No. of Pieces.	Rate per Piece.	Your own Average.	Your own Rate.
Band Moulding Frames, one side.	30	$ .12	......	....
Band Moulding Frames, two sides.	15	.24	......	....
Putting down Thresholds.	24	.15	......	....
Fitting Doors..........	20	.18	......	....
Hanging Doors.......	20	.18	......	....
Putting on Rim Locks.	36	.10	......	....
Putting on Mortice Locks.	14	.25	......	....

Different kinds of Work per ft.	Feet.	Rate.	Average.	Your own Rate.
Putting down Base and Quarter Round.	120	.03	......	....
Putting on Base Moulding.	240	.1½	......	....
Cap and Moulding for Wainscoting.	180	.02	......	....
Putting up Cornice....	24	.15	......	....
Making Gutters in Cornice.	50	.07	......	....
Putting up Corner Casings.	70	.05	......	....

PRICE LIST OF LUMBER.

The Prices in this Table are to be filled out by Carpenters to suit the Locality in which they live.

Kind of Material.	1st. Grade.	2nd. Grade.	3rd. Grade.
Dimension Lumber,..	......	......	......
Sheathing, ...	......	......	......
Fencing, ...	......	......	......
Cove Siding, ...	......	......	......
Beveled Siding,......	......	......	......
Shiplap, 8 inch, ...	......	......	......
Barn Siding, 12 inch,..	......	......	......
Battens, Ogee,.......	......	......	......
Battens, ½ inch,......	......	......	......
Shingles, Pine,......	......	......	......
Shingles, Redwood,...	......	......	......
Flooring, 6 in. Soft P.,.	......	......	......
Flooring, 4 in. Soft P.,.	......	......	......
Flooring, 6 in. Hard P.,.	......	......	......
Flooring, 4 in. Hard P.,.	......	......	......
Flooring, 4 in, Oak,...	......	......	......
Flooring 4 in. Maple,..	......	......	......
⅞ Ceiling, 4 in. Soft P.,.	......	......	......
⅞ Ceiling, 4 in. Hard P.,.	......	......	......

PRICE LIST OF LUMBER

CONTINUED.

KIND OF MATERIAL.	1st. Grade.	2nd. Grade.	3rd. Grade.
Pine Finish, $\frac{7}{8}$........	......	......	......
Pine Finish, $1\frac{1}{8}$	......	......	......
Oak Finish, $\frac{7}{8}$........	......	......	......
Chestnut Finish,......	......	......	......
Black Walnut Finish,.	......	......	......
Poplar Finish,.......	......	......	......
Base, 8 inch.........	......	......	......
Base, 10 inch.........	......	......	......
Casings, 5 inch......	......	......	......
Plinth Blocks,.......	......	......	......
Rosette Blocks,......	......	......	......
Doors, 2.6x6.6x$1\frac{3}{8}$....	......	......	......
Doors, 2.8x6.8x$1\frac{3}{8}$....	......	......	......
Doors, 3x7x$1\frac{3}{4}$	......	......	......
Sash Doors,..........	......	......	......
Windows, 12x32, 4 lt..	......	......	......
Blinds, 12x32, 4 lt	......	......	......
Windows, 24x34, 2 lt..	......	......	......
Blinds, 24x34, 2 lt....	......	......	......

PRICE LIST OF LUMBER
CONTINUED.

KIND OF MATERIAL.	SIZE AND PRICES.		
Crown Moulding,.....	......	......	......
Bed Moulding,.......	......	......	......
Base Moulding,.......	......	......	......
Band Moulding,......	......	......	......
Panel Moulding,......	......	......	......
Cove Moulding,.......	......	......	......
Door Stops,.........	......	......	......
Window Stops,.......	......	......	......
Parting Stops,........	......	......	......
Quarter Round, ...	......	......	......
$\frac{3}{4}$ Round, ...	......	......	......
Thresholds, ...	......	......	......
Water-table, ...	......	......	......
Wainscoting Cap,....	......	......	......
Window Stools,.......	......	......	......
Corner Beads,........	......	......	......

WHAT IS IT WORTH?

POINTERS ON ESTIMATING.

As we have said before, we do not believe there can be a better, easier and safer way of estimating than the list system with its average day's work and rate per square, foot or piece. It is true there is some margin of differences as to the amount of time required to do any given piece of work. The average of that time is what is wanted as a standard of estimating. Our Table of Prices has been arranged from a record kept of work in actual experience in doing work, and is so arranged that every mechanic can, by filling out the blank columns with his own average, establish rates to suit himself or any given neighborhood.

The Table of Prices was made on a basis of $3.50 per day, and 10 hours for a day's work. If an estimate is wanted for 9 hours, add 1 tenth to the price, if for 8 hours, add 1 fifth. The prices can be easily made in the blank columns for any rate per hour and any number of hours per day.

While the Table shows the average day's work with the rate per square, foot, or piece, for nearly all kinds of work; yet we think it proper to show how, and why variations should be made. Also, how to make short cuts by combinations.

What is it worth? Framing and placing joists in position per square, $ .70 to $ .90
Laying floor per square,...... .60 to 1.75

Framing and laying,........... 1.30 to 2.60

The bridging of joists should be estimated at from 5 to 10 cents per joist for each row of bridging.

Double Floors.— Where one floor is laid over another, it is worth ¼ more to lay the second floor than the first. Thus, if it is worth 60 cents per square, to lay the first floor, it is worth 75 cents per square for the second, or $1.35 per square for both.

Framing floors for brick buildings may be estimated at the same rate as for frame, while there is less framing, more time is required to place the joists in position; thus, making the labor about equal.

As a building progresses in hight, more time is required to place joists in position; hence. 10 per cent should be added to each succeeding story after the first.

What is it worth? To Frame and raise a

building, per square, ...	$ .60	to	$ .90
Sheathing same per square,...	.45	to	.60
Siding same per square, ...	1.20	to	1.75
Total.....................	2.25	to	3.25

Thus, the outside walls of a house may be estimated at $2.25 to $3.25 per square.

Framing should include raising. Sheathing and Siding should be estimated sufficiently high to cover the cost of building scaffolds. It is worth $\frac{1}{3}$ more to sheathe a building inside than outside; and twice as much to sheathe it diagonally.

Siding is subject to large variations as a man can side four times as fast in some places as he can in others. The amount an average workman will put on in a day, depends upon the number, size and shape of the openings he has to side around, the hight of the building, and the amount of scaffolding he has to do. Difficult places to side can be readily seen on a building or a plan, and should be estimated at a higher rate than is customary for such work.

We have known men to put on siding for 60 cents a square. Not one man in ten can make anything like respectable wages at this price, even on the plainest kind of work and

under the most favorable circumstances.

The average is not more than 3 squares per day, which amounts to $1.80 per day, and there are chances that he would not do as well.

What is it worth?

Framing roofs per square, ...$	.60 to $1.20
Sheathing roofs per square,...	.45 to .70
Shingling roofs per square,...	1.25 to 1.75
Total	2.30 to 3.65

Thus, to frame, sheathe and shingle a roof, it is worth from $2.30 to $3.65 per square. Every hip or valley in a roof is worth from $.75 to $1.50 each, for sheathing and shingling.

The shingling of belt courses and gables with dimension shingles, is worth from $2.00 to $4.00 per square, according to the windows and difficult places the shingler has to contend with.

What is it worth? To make and finish a window frame all complete in a residence, is worth from $2.50 to $25.00 according to size and style of finish. Plain frames with soft wood finish will average about $2.70 per frame; while large transom frames, twin-windows etc., finished in hard wood, may be worth up to $25.00 and even more.

To fit, hang and lock a common door, using 1 pair of loose pin butts and a common mortice lock, is worth 60 cents. The average day's work is about 6 doors per day. If the doors are large and require 3 butts to a door, it is worth 75 cents per door. Front doors having complicated locks with night keys etc., are worth $1.50 to $2.00 per door.

SLIDING DOORS.—

Setting partitions and putting up track,	$7.00
Setting jambs,	1.00
Casing door frame,	1.00
Band moulding frame,	.25
Hanging doors and putting on lock,	3.50
Threshold and stops,	.25
Total,	$13.00

Thus, Sliding doors are worth $13 per set, and may vary according to size and style of finish, to $30.

FOLDING DOORS.—

To fit, hang, lock, and put flush bolts, on folding doors is worth $1.75 to $3.50 per set.

WAINSCOTING.—

Plain wainscoting is worth about 90 cents per square, and the cap should be estimated by the foot; extra, according to the style of

What is it worth? It should be remembered that a fine hardwood finish is worth twice and three times as much as a common soft pine finish.

Estimating Windows.—

Making frame,	$1.20
Hanging blinds,	.25
Setting frame in building,	.25
Fitting sash,	.20
Hanging sash with weights,	.25
Casing window,	.30
Band moulding frame,	.12
Cutting in stops,	.09
Total,	$2.66

Estimating Doors.—

Making plain frame,	$ .90
Setting frame in building,	.25
Casing frame,	.44
Band moulding frame,	.24
Fitting and hanging door,	.36
Putting on mortice lock,	.25
Cutting in thresholds,	.15
Cutting in stops,	.12
Total,	$2.71

Thus it is worth $2.71 per frame to make and finish common soft pine door frames complete in a building.

finish. Paneled wainscoting is often worth twice and three times as much as plain work.

SINKS.—

To finish a kitchen sink in the plainest style, is worth $2; and some styles finished in hard wood, are worth up to $10.

BATH ROOMS.—

A bath room having in connection a water-closet and wash-bowl, finished in the plainest style, willtake a good workman two days, and is worth $7.

An inexpreienced workman in this kind of work, will require about three days to complete the same.

Some styles of hard wood finish will require from 4 to 6 days' work, and is worth from $14 to $21.

PANTRIES.—

The shelving and finishing of a pantry in the plainest style, is worth from $3 to $5.

Pantries with flour chests, spice drawers, and numerous other things, shelves enclosed with glass panel doors; all elegantly fitted up, are worth from $25 to $40.

STAIRS.—

The cheapest kind of cellar stairs are worth from $2 to $5. The plainest kind of box stairs are worth from $8 to $12 per flight.

Plain open stairs with hand rail, newel post, and balusters, are worth from $20 to $35. Stairs and Stair Cases finished in hard wood, will vary from $50 to $150. It is frequently worth from $10 to $20 to set the newel posts and put up the rail.

CORNICE.—

Cornice may be estimated by the lineal foot in the following manner. A cornice is composed of several members, the most common kind is the five member cornice, which consists of a plancer, fascia, frieze, crown and bed moulding. It may be estimated at 15 cents per foot. If a cornice has more than five members, add from 2 to 3 cents per foot for each additional member. If there are less than five members, a similar deduction may be made. If a cornice has brackets, it will be necessary to add a sufficient amount to cover the cost of putting them up.

GUTTERS.—

These are variously formed, and are worth from 4 to 10 cents per lineal foot. A standing gutter is worth from 4 to 6 cents per foot. A flush gutter, or one sunk in a roof, is worth from 6 to 10 cents per foot.

PORCHES.—

Porches may sometimes be estimated by

the lineal foot, at from \$2 to \$4 per foot. This plan, however, is not the best method of estimating porches; its principal advantage, is the simple manner of estimating.

The most common styles of porches may be estimated as above, with quite satisfactory results. The best and most accurate way, however, is to estimate the frame work, flooring, ceiling, and roofing by the square; the cornice, gutters, and lattice work by the foot; the steps, columns, brackets and ornamental work by the piece. After suming up the various parts, the result may be taken as the most reliable estimate.

ROOF FRAMING,

HIPS AND VALLEYS.

The subject of roof framing, particularly that of hips and valleys, is one which thoroughly taxes the skill and ingenuity of the builders. Many ingenious and useful diagrams have been published from time to time, showing how to find the lengths and bevels of hips, valleys and jacks; each plan claiming some special advantage over anothder. Every enterprising mechanic has a desire to learn the simplest method of obtaining certain results.

The system which we shall use in this article, is one by which the lengths of common rafters, hips, valleys and jacks, with all their different bevels, on roofs of any pitch, may be easily found without the use of drawings; and is so simple that anyone can understand it and find the lengths and cuts in less time than it takes to describe the operation.

Our system consists of a table from which the lengths and cuts of any rafter may be determined at once.

EXPLANATION OF THE TABLE.—

Column 1 shows the pitch of roofs, in the number of inches rise to the foot run. Column 2 shows the length of common rafter to a foot run. Column 3 shows the length of a hip or valley corresponding to a foot run of the common rafter. Column 4 shows what figures to take on the Square for the top and bottom cuts of the common rafter, which is always 12 for the bottom cut, and the number of inches the common rafter rises to a foot run for the top cut. Column 5 shows what figures to take on the Square for the top and bottom cuts of a corresponding hip or valley, which is always 17 for the bottom cut, and the number of inches the common rafter rises to a foot run for the top cut. Column 6 shows what figures to take on the Square, to make the top bevel of the jack rafters, for which, always take 12 on the tongue of a square; and the length of the common rafter for a foot run on the blade. The blade gives the cut. The plumb cut, or down bevel is always the same as that of the common rafter.

To avoid a complication of fractions the figures given in columns 2 and 3 are given in feet and decimals. To find the lengths of common rafters, hips, valleys and jacks, it is only necessary to multiply the run by the figures given, corresponding to the pitch wanted.

RAFTER TABLE.

1 Pitch of roofs.	2 Common rafter, 1 foot run.	3 Corresponding hips or valleys.	4 Common rafter cuts.	5 Hip and valley rafter cuts.	6 Jack rafter cuts.
Inches.	Feet	Feet	Inches.	Inches.	Inches.
6	1.12	1.50	12 & 6	17 & 6	13½ & 12
7	1.16	1.53	12 & 7	17 & 7	13⅝ & 12
8	1.20	1.56	12 & 8	17 & 8	14⅜ & 12
9	1.25	1.60	12 & 9	17 & 9	15 & 12
10	1.30	1.64	12 & 10	17 & 10	15⅝ & 12
12	1.42	1.73	12 & 12	17 & 12	17 & 12
15	1.60	1.88	12 & 15	17 & 15	19¼ & 12
13	1.80	2.07	12 & 18	17 & 18	21⅝ & 12

We will now give a practical example showing how to find the lengths of rafters by the table.

EXAMPLE.— What will be the lengths of rafters on a building 16 feet wide, roof of 7 inches pitch, hipped to the center and rafters placed 16 inches from centers?

ANALYSIS.— The run of the rafter is $\frac{1}{2}$ the width of the building, which is 8 feet. Multiplying the run by the length of rafter for 1 foot run, 7 inch pitch, column 2 of the table, and pointing off the product as in multiplication of decimals; we have the length of rafter in feet, and a decimal of a foot, the decimal part, must be multiplied by 12 to reduce it to inches.

OPERATION.— $1.16 \times 8 = 9.28$ feet.
$.28 \times 12 = 3.36$ inches.

Thus, the length of the common rafter is 9 feet and 3.36 inches. The .36 being a decimal of an inch and very small, it may be discarded.

The corresponding hip or valley may be found as follows: $1.53 \times 8 = 12.24$ feet.
$.24 \times 12 = 2.88$ inches.

The decimal .88 being almost eqnal to an inch, it is best to retain it, and call it $\frac{3}{4}$ of an inch. Thus, the length of the hip would be 12 feet $2\frac{3}{4}$ inches.

If the rafters are placed 16 inches from centers, the run of the first Jack will be 16 inches. Taking the same figures in the table as we took to find the common rafter, and multiplying by 16 inches we have as follows: $1.16 \times 16 = 18.56$

The decimal .56 being equal to ½ inch, it is best to retain it; thus, the length of the first jack would be 18½ inches; the second, twice that; the third, three times; and so on, till the required number are found.

Our table covers almost every pitch of roof commonly used, but suppose some pitch is wanted not represented in the table; it is a very easy matter to find the lengths and cuts of any rafter; hip, valley, or jack, on roofs of any pitch, with a square and 2 foot rule.

There are a few very simple facts, which if remembered, will serve to make hip and valley roof framing so plain and easily understood; that no one need have any difficulty in finding the length and cut of any rafter.

The pitch of a roof is always designated by the number of inches it rises to the foot run; hence, the cut of a common rafter is always 12 for the bottom cut, and the rise of the roof to the foot for the top cut.

The cut of a corresponding hip, or valley

of equal pitch, is always 17 for the bottom cut, and the rise of the common rafter to the foot for the top cut. Thus, if 12 and 8 cuts the common rafter, 17 and 8 will cut the hip or valley.

The top bevel of a jack rafter is always 12 on the tongue of a square, and the length of the common rafter for a foot run, on the blade; the blade gives the cut. In other words, the run of the common rafter on the tongue, and the length on the blade, will always give the top bevel of a jack rafter. The plumb cut or down bevel of a jack, is always the same as that of the common rafter.

To find the length of a common rafter, take the run on the blade of a square, and the rise on the tongue, measure across and you have the length. To find the length of a corresponding hip or valley, take the run of the common rafter on both blade and tongue, and measure across; now take the figures thus obtained, on the blade, and the rise of the common rafter on the tongue, and measure across again, this will give the length of a hip or valley. The length of a jack rafter may be found in the same manner as the common rafter, by taking the run on the blade, and the rise on the tongue.

The lengths of hips and valleys on roofs of unequal pitches, may be found in the same manner by taking figures on the blade and tongue of a square, which will represent the different pitches.

For example, suppose a roof hips 6 feet on the right side of a hip, 8 feet on the left side, and both sides have a rise of 6 feet, how will we find the lengths and bevels of the rafters?

Let it be understood that we are working from a scale of 1 inch equals 1 foot.

First, take the run of the common rafter on the right side of the hip, (6 inches) on the blade, and the rise of the roof (6 inches) on the tongue, measure across and you have the length of the common rafter on the right side of the hip, which is 8½ inches, equal to 8½ feet. 6 and 6 will give the cuts. Take the run of the common rafter (6 inches) on the tongue, and the length, (8½ inches) on the blade, for the top bevel of the jacks on the right side of the hip; the blade gives the cut. The plumb cut, or down bevel of the jack, will be the same as that of the common rafter.

Next, take the run of the common rafter on the left side of the hip (8 inches) on the blade, and the rise of the roof [6 inches] on

the tongue, measure across and you have the length of the common rafter on the left side of the hip; which is 10 inches, equal to 10 feet. 6 and 8 will give the cuts. Take the run of the common rafter (8 inches) on the tongue, and the length, (10 inches) on the blade, for the top bevel of the jacks on the left side of the hip. The blade gives the cut.

The plumb cut, or down bevel of the jacks will be the same as that of the common rafter.

Next, to find the length of the hip, take the run of the common rafter on the right side of the hip (6 inches) on the tongue, and the run of the common rafter on the left side of the hip (8 inches) on the blade, measure across and you have (10 inches) the run of the hip. Next, take the run of the hip, [10 inches] on the blade, and the rise of the roof [6 inches] on the tongue, measure across and you have the length of the hip rafter, [$11\frac{5}{8}$ inches] equal to 11 feet $7\frac{1}{2}$ inches. 10 and 6 will give the cuts of the hip.

ROOF FRAMING,

ILLUSTRATED.

It will undoubtedly be interesting to many of our readers to see the framing of hip and valley roofs thoroughly illustrated; and, in the simplest and plainest manner possible.

The framing of hip and valley roofs is quite easy, if the principals are made plain by proper diagrams. Many of the diagrams which have been published in explanation of hip and valley roof framing, have been to complicated for practical use, especially so, with new beginners in roof framing.

We will now show by means of diagrams, the simplest manner possible for finding the lengths and cuts in plain hips and valleys; and there will be no lines crossing each other tending to confuse the inexperienced.

Referring to Fig. 1 of our diagrams; first draw a horizontal line twice the run of the common rafter, A B. From the center of this line at C, erect a perpendicular line continuing it indefinitely. Next, set off on the

perpendicular line, the rise of the common rafter C to D, connect D and B for the length of the common rafter. A bevel set in the angle at D will give the top cut, and in the angle at B the bottom cut. Next, set off on the perpendicular line the length of the common rafter, C to E, which is exactly the same length as the line D B, connect E with A for the length of the hip rafter. Next, space off the jacks on the line A C and draw perpendicular lines joining the hip line A E. The lines J J J are the lengths of the jack rafters and a bevel set in the angle at F, will give the the bevel across the backs of the same, the plumb cut or down bevel of a jack, is always the same as that of the common rafter.

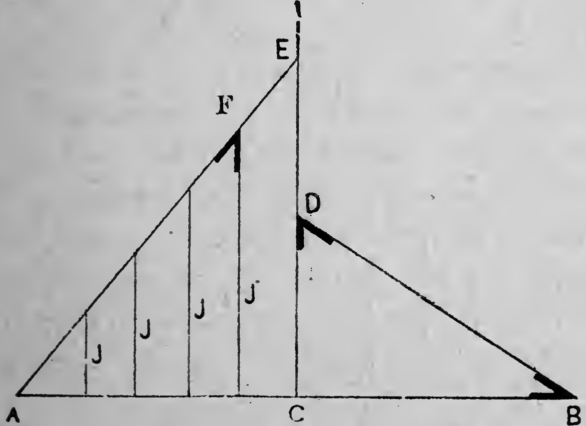

Fig. 1.

Now we have shown all the lines necessary to be drawn, the plan shows every thing but the cut of the hip rafter; and this, may it be remembered is always 17 inches on the blade of a square for the bottom cut, and the rise of the common rafter to the foot run on the tongue for the top cut. As some may think a plan that does not show the cuts of a hip as well as its length, is incomplete, we will take the same plan and by the addition of 3 more lines show every thing that can be desired. Referring to figure 2 of our diagrams we would say, draw the lines the same as in figure 1 then. measure off on the perpendicular line, the run of the common rafter C to F, connect F with B and square up

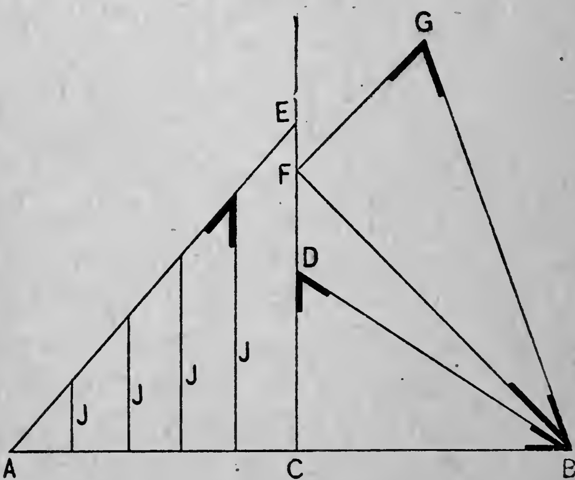

Fig. 2.

from F the rise of the common rafter to G, connect G and B for the length of the hip.

A bevel set in the angle at G will give the top cut and in the angle at B the bottom cut.

It will be noticed in figure 2 that the lines A E and G B, are of the same length and in both cases represent the hip rafter, but show it in different positions. A E shows the hip in position to find the length and bevel of the jacks, and G B shows the hip in position to find the bevels for cutting the hip.

BEVEL FOR HIP OR VALLEY.

A question in roof framing which sometimes comes up in actual practice, is how to cut the bevel on the lower end of a hip or valley corresponding to a square cut on the common rafter. This cut is only used in cutting the ends of hip and valley rafters, preparatory to nailing on the fascia and crown moulding. Every carpenter knows that a square cut on a hip or valley will not correspond with a square cut on the common rafter, and but few know how to obtain the requird bevel. It may be obtained in the following manner: Take 17 inches on the blade of a square and one-half

the rise of the common rafter to a foot run on the tongue and the tougue gives the cut.

For example, suppose we have a roof of one-third pitch. This is a rise of 8 inches to the foot run. 8 and 12 will make the common rafter cuts and 17 and 4 the cut on the end of the hip or valley rafter corresponding to a square cut of the common rafter.

The diagram figure 3 shows the manner of applying the square to the hip or valley.

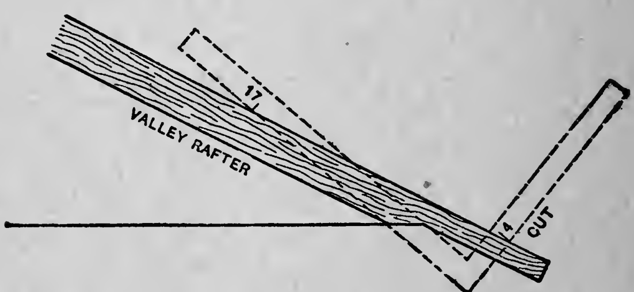

Fig. 3.